UNITED STATES PATENT AND TRADEMARK OFFICE

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10/587,533	07/26/2006	Alexey Vitalievich Ryzhykh	42P24165	9662

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EXAMINER
NICKERSON, JEFFREY L

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *16 April 2009*.
2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-20* is/are pending in the application.
   4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) *1-20* is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on *03 June 2008* is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All   b) ☐ Some *   c) ☐ None of:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____.
      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1.   This communication is in response to Application No. 10/587,533 filed nationally on 26 July 2006 and internationally on 31 May 2006. The response presented on 16 April 2009, which provides change to claims 1, 8, 10-15, provides change to the specification, and provides arguments, is hereby acknowledged. Claims 1-20 have been examined.

Drawings

2.   Applicant's response filed 16 April 2009 providing change to reference characters in the specification is noted. All outstanding objections to the drawings are hereby withdrawn.

Specification

3.   Applicant's response filed 16 April 2009 providing change to the specification is noted. All outstanding objections to the specification are hereby withdrawn. However, new objections may appear below.

4.   The abstract of the disclosure is objected to under 37 CFR 1.72(b) because it contains implied phraseology. The phrase "are disclosed" in the first sentence falls into the category of implied phraseology and should be deleted. Correction is required. See MPEP § 608.01(b).

Claim Objections

5.   Applicant's response filed 16 April 2009 providing change to claims 12-14 is noted. All outstanding objections to the claims are hereby withdrawn. However, new objections may appear below.

6.   Claims 1-7 are objected to under 37 CFR 1.75(d)(1) because of an improper use of antecedent basis.

Regarding claim 1, this claim recites the limitation "a larger RDMA buffer" in lines 7-8 (second instance in stanza 3). There is *sufficient* antecedent basis for this limitation in the claim and correction is therefore required. For purposes of further examination this phrase will be treated "the larger RDMA buffer".

Regarding claims 2-7, these claims inherit the objections of their parent claim(s).

7.   Claims 1-7 are objected to under 37 CFR 1.75 for minor grammatical errors.

Regarding claim 1, this claim recites "wherein the larger RDMA buffer is not provisioning and registered…". The word "provisioning" should be "provisioned" and will be treated as such for purposes of further examination. Correction is required.

Regarding claims 2-7, these claims inherit the objections of their parent claim(s).

Response to Arguments

8.   Applicant's response filed 16 April 2009, presenting arguments with respect to

the rejections under 35 USC 103 over Chang in view of Lee, have been fully considered

and are persuasive. Therefore, the outstanding rejections are hereby withdrawn.

However, new grounds of rejection may appear below.

Claim Rejections - 35 USC § 103

9.   The text of those sections of Title 35, U.S. Code not included in this action can

be found in a prior Office action.

10.   Claims 1, 3-8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Creemer (US 6,014,727), and in further view of Lee (US 2006/0227799 A1).

Regarding claim 1, Creemer teaches a method comprising:

        pre-allocating each of a plurality of buffers to a difference connection of a plurality

of connections (Creemer: abstract; Figures 2-3; col 2, lines 1-20);

        determining that an allocated buffer of the plurality, which has been allocated for

a given connection, has insufficient size to transfer data (Creemer: Figure 3; col 2, lines

29-60; col 5, lines 35-52; col 6, lines 43-51);

        provisioning and allocating a larger buffer for the given connection, wherein the

larger buffer is not provisioned and allocated for another connection of the plurality, and

wherein a size of the larger buffer is larger than a size of the pre-allocated buffer

(Creemer: Figures 2-4; col 2, lines 29-60; col 5, lines 35-52; col 6, lines 43-51).

Creemer does not teach wherein the buffer is a pre-registered RDMA buffer; or

transferring the data to a network using the buffer.

Lee, in a similar field of endeavor, teaches wherein the buffer is a pre-registered

RDMA buffer (Lee: [0003]); and

transferring the data to a network using the buffer (Lee: [0003]).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to utilize the teachings of Lee for using an RDMA system. The

teachings of Lee, when implemented with the Creemer system, will allow one of

ordinary skill in the art to adjust buffer sizes as needed, in an RDMA environment. One

of ordinary skill in the art would be motivated to utilize the teachings of Lee with the

Creemer system in order to apply the buffer technique to commonly used networking

environments.

Regarding claim 3, the Creemer/Lee system teaches wherein said determining

comprises comparing a size of the data to a predetermined threshold (Creemer: col 7,

lines 17-24).

Regarding claim 4, the Creemer/Lee system teaches further comprising comparing

sizes of a plurality of elements of an input-output vector (incoming packet stream) to the

predetermined threshold (Creemer: col 7, lines 17-24 provides that the data stream for

that specific connection is compared to the buffer threshold size for the small buffer;

Lee: Figure 5A for outgoing buffer queue).

Regarding claim 5, the Creemer/Lee system teaches wherein said provisioning

comprises allocating and registering the larger RDMA buffer during a communication

phase (Creemer: col 6, lines 30-42 for larger buffer; Lee: [0003]-[0004] for allocating

and registering during communication).

Regarding claim 6, the Creemer/Lee system teaches wherein said provisioning

comprises:

     unregistering the pre-registered RDMA buffer (Lee: [0025]); and

     freeing the memory used by the pre-registered RDMA buffer (Lee: [0025]).

Regarding claim 7, the Creemer/Lee system teaches wherein said transferring

comprises:

     copying data from a source to the larger RDMA buffer (Lee: Figure 5A, [0036],

[0083]-[0086]); and

     performing an RDMA transfer from the larger RDMA buffer to the network (Lee:

Figure 5A; [0085]-[0087]).

Regarding claim 8, this article of manufacture claim contains limitations found within

claims 1, 3, and 5, and the same rationale of rejection is used, where applicable.

Regarding claim 10, this article of manufacture claim contains limitations found within in

claim 7, and the same rationale of rejection is used, where applicable.

11.   Claims 2, 9, and 15-19 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Creemer (US 6,014,727), in view of Lee (US 2006/0227799 A1), and

in further view of Kato (US 4,805,168).

Regarding claim 2, the Creemer/Lee system teaches:

        wherein a receiver readies itself to receive data by provisioning a larger RDMA

buffer to receive the data (Creemer: col 5, lines 35-52; Lee: [0004]).

        The Creemer/Lee system does not teach further comprising:

        sending a control message indicating that a receiver is to ready itself to receive

the data; or

        prior to said transferring, receiving an acknowledgement message indicating the

receiver has readied itself to receive the data.

        Kato, in a similar field of endeavor, teaches further comprising:

        sending a control message indicating that a receiver is to ready itself to receive

the data (Kato: col 5, lines 26-39); and

        prior to said transferring, receiving an acknowledgement message indicating the

receiver has readied itself to receive the data (Kato: col 5, lines 26-39).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the teachings of Kato for using transfer setup signaling. The teachings of Kato, when implemented in the Creemer/Lee system, will allow one of ordinary skill in the art to instruct the destination to enlarge their buffer sizes, and receive a ready signal from the destination once they are done. One of ordinary skill in the art would be motivated to utilize the teachings of Kato in the Creemer/Lee system in order to avoid overwhelming an intended receiver or writing to memory before it is correctly allocated, causing data corruption.

Regarding claim 9, this article of manufacture claim contains limitations found within claim 2, and the same rationale of rejection is used, where applicable.

Regarding claim 15, this method claim contains limitations found within that of claims 1 and 2, and the same rationale of rejection is used, where applicable.

Regarding claim 16, this method claim contains limitations found within that of claim 2, and the same rationale of rejection is used, where applicable.

Regarding claim 17, this method claim contains limitations found within that of claim 5, and the same rationale of rejection is used, where applicable.

Regarding claim 18, this method claim contains limitations found within that of claim 6,

and the same rationale of rejection is used, where applicable.

Regarding claim 19, this method claim contains limitations found within that of claim 7,

and the same rationale of rejection is used, where applicable.

12.   Claims 11 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Creemer (US 6,014,727), in view of Lee (US 2006/0227799 A1), and in further

view of Official Notice.

Regarding claim 11, this system claim contains limitations found within that of claim 1

and the same rationale of rejection is used, where applicable; and further comprising:

        an interconnect (Creemer: Figure 1);

        one or more processors coupled with the interconnect (Creemer: Figure 1; Figure

6; col 9, lines 31-60);

        a DRAM coupled with the interconnect to store data (Creemer: col 5, lines 52-

67);

        a network interface device coupled with the interconnect to transfer data to a

network (Creemer: Figure 6, item 812; col 10, lines 1-8).

        The Creemer/Lee system does not teach wherein the network interface device

uses an Ethernet protocol.

An official notice is taken that such use of an Ethernet protocol as a type of communication protocol was well known in the art at the time the invention was made by one of ordinary skill in the art.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize these known teachings for using Ethernet. These known teachings, when implemented with the Creemer/Lee system, will allow one of ordinary skill in the art to use Ethernet as their communication protocol. One of ordinary skill in the art would be motivated to utilize these known teachings in the Creemer/Lee system in order to enable practicing the invention.

Regarding claim 13, this system claim contains limitations found within claims 3, 5, and 7, and the same rationale of rejection is used, where applicable.

Regarding claim 14, the Creemer/Lee system teaches wherein the pre-registered RDMA buffer has a size ranging from 100 to 2000 bytes (Creemer: col 9, lines 9-17); and

wherein the provisioned RDMA buffer has a size ranging from 1000 to 200,000 bytes (Creemer: col 9, lines 18-30).

13.   Claims 12 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Creemer (US 6,014,727), in view of Lee (US 2006/0227799 A1) and Official Notice, and in further view of Kato (US 4,805,168).

Regarding claim 12, the Creemer/Lee/ON system teaches:

wherein a receiver readies itself to receive data by provisioning a larger RDMA

buffer to receive the data (Creemer: col 5, lines 35-52; Lee: [0004]).

The Creemer/Lee/ON system does not teach further comprising:

sending a control message indicating that a receiver is to ready itself to receive

the data; or

prior to said transferring, receiving an acknowledgement message indicating the

receiver has readied itself to receive the data.

Kato, in a similar field of endeavor, teaches further comprising:

sending a control message indicating that a receiver is to ready itself to receive

the data (Kato: col 5, lines 26-39); and

prior to said transferring, receiving an acknowledgement message indicating the

receiver has readied itself to receive the data (Kato: col 5, lines 26-39).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to utilize the teachings of Kato for using transfer setup signaling.

The teachings of Kato, when implemented in the Creemer/Lee/ON system, will allow

one of ordinary skill in the art to instruct the destination to enlarge their buffer sizes, and

receive a ready signal from the destination once they are done. One of ordinary skill in

the art would be motivated to utilize the teachings of Kato in the Creemer/Lee/ON

system in order to avoid overwhelming an intended receiver or writing to memory before

it is correctly allocated, causing data corruption.

Regarding claim 20, this method claim contains limitations found within claim 11, and

the same rationale of rejection is used, where applicable; and further comprising:

a processor having multiple cores (ON: Multiple core processors were well

known in the art at the time the invention was made. Obvious to enable practicing the

invention).

Citation of Pertinent Prior Art

14.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

a.   Elzur (US 2009/0034551 A1; US 7,508,837 B2) discloses an RDMA

capable system that has per-connection buffers and dynamically manages sizes

along with a shared queue.

b.   Rohde et al (US 7,522,623 B2) discloses incremental buffer size

comparison and promotion.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEFFREY NICKERSON whose telephone number is (571)270-3631. The examiner can normally be reached on M-Th, 9:00am - 7:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Caldwell can be reached on (571)272-3868. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. N./
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Examiner, Art Unit 2442

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